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Renovation Nation

> Bimonthly news and tips on green home remodeling from the Seattle Department of Planning and Development

Styles that endure over time require fewer aesthetic updates.

Photo: Jon Alexander (from Built Green case study on Sensible House)

Inside:

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This newsletter can be made available on request to accommodate people with disabilities and those who need language translation assistance.

www.seattle.gov/dpd/sustainability

Timeless Design

Talk of durability tends to focus on materials and products, examining how long they'll last given wear and tear. But what about the staying power of a design itself? The physical durability of a building element is rendered moot if it's removed before its time because it looks dated. What makes a kitchen look fresh five, ten—even fifty years from now?

With home décor becoming as trend-oriented as clothing fashion, there's the increased hazard of painting ourselves into an aesthetic corner on our home improvement projects. Do we really want our bathroom tile to proclaim "I'm fall 2005" in 2010? Given the amount of financial, natural and emotional resources that go into remodeling projects, it only makes sense to look for designs that last longer than it takes to repay that home improvement loan.

Style with staying power

This is easier said than done, though. We have a desire for the new, and it can be difficult to distinguish new, timeless design from new, soon-to-be-dated design. How to tell? One trick is to head to the library, and scour older home style books and back issues of shelter magazines. Depending on how far back they go, you can get a good idea of what looks have staying power. Unsurprisingly, most designs will appear dated; however, you'll likely run across a few that are several years old that still feel surprisingly fresh. Try to determine the design approach taken by these projects and whether it could apply to your home.

Keep what works

It's tempting to pull everything out and start with the proverbial blank slate. But there are likely many parts of your home that work perfectly well. Retaining these—and limiting the scope of the remodel—can save substantial amounts of money while helping tie the remodeled portions of home to existing elements.

A time-tested strategy: remodeling in the theme of your home's original architectural style. A home that's a mishmash of styles is likely to be less appealing at resale than one with a unified look and feel, and increases the chances the new owner will feel compelled to rip things out and start new. This isn't to say it's impossible to mix styles, but it does take a particular knack to do successfully. Certain interior designers and architects are particularly adept at merging the old with the new. Finding such a professional can drastically increase the likelihood that you achieve success on your project.

> Given the resources going into remodeling projects, it makes sense to look for designs that last at least as long as your mortgage payments.

Be trendy at the margins

If you're unable (or just unwilling) to beat the trend bug, relegate it to the elements that are easiest to change: soft coverings, accessories, and surface decorations. Trends usually come in more extreme forms than timeless style, meaning they can serve as lively accents to a calmer backdrop.

Exercise care with built-in elements, as these are more difficult and disruptive to change. Treat them as you would wall and doorway layouts. When it comes to the bones of the space, focus on timelessness and adaptability. Int he next issue we'll focus on adaptable design or universal design: designing with the goal of creating spaces that welcome users of all ages and abilities.

Resources on timeless design

> *How Buildings Learn: What Happens after They're Built* by Stewart Brand (Penguin Books, 1995).

> *Patterns of Home: The Ten Essentials of Enduring Design* by Max Jacobson (Taunton Press, 2002).

> *The Timeless Way of Building* by Christopher Alexander (Oxford University Press, 1979).

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Vandervort Architects and GreenLeaf Construction's *Green Compact* is a featured Built Green case study.

Green remodel resource:

Built Green™ Case Studies

Seven Built Green projects, all winners of the 2005 Seattle Built Green Design Competition, are featured in a new series of case studies produced by Seattle's Green Building Program. One project, the Capitol Hill House by *blip designlab*, is an extensive remodel featuring solar electric and solar hot water systems, natural ventilation, and extensive energy saving features, among other green elements. The other case studies profile new construction homes, but provide many ideas for remodeling projects as well.

Find the case studies online at :
<seattle.gov/dpd/sustainability>
(click on *Case Studies*).

Events/educational opportunities

Thursday 04/20/06, 7-9pm
Green Home Remodel
Thinking about remodeling? Help is here! Learn the basics of green remodeling, including design and material selection, from the author of Seattle's Green Home Remodel Guides.
Cost: Free; pre-registration required.
Details: <phinneycenter.org> or (206) 783-2244.

Wednesday 04/26/06, 7-9pm
Sustainable Landscapes & Rainwater Harvest
Learn about natural drainage options, sustainable landscape design, and rainwater harvest from local experts Mike Broili and Cameron Scott.
Where: Phinney Neighborhood Center.
Cost: $5 suggested donation; free to Guild members.
Details: <ecobuilding.org> click on 'Events'.

Web site of the month

builtgreen.net
Built Green™ is a program of the Master Builders Association of King and Snohomish Counties that certifies green homes using a menu-based system of design strategies and materials choices to help enhance a home's environmental performance. With over 200 action items on the Built Green checklist, an owner or builder has many ways to "green up" their project. Checklist items cover all aspects of green building, including site and water issues, energy conservation, materials choices, and health and indoor environmental quality. Homes are awarded an achievement level, from one to five stars, depending on total number of points achieved. The more stars a home has, the better it performs.

The Built Green website offers plenty of information, including virtual tours of Built Green certified homes, free access to the Built Green checklists, and the chance to sign up for the monthly Built Green newsletter. The online virtual tours provide 360 degree views of home elements and text describing the homes' environmental and health features.

Green home Q&A

Q: I keep hearing about "offgassing." What is it, and is it a problem?

A: Certain building materials and most paints and finishes release chemical compounds into the air, often just after application or installation and sometimes over the life of the installation. These chemicals are called *volatile organic compounds*, or VOCs. VOCs are substances that easily convert to gas at room temperatures. Paints and finishes often contain large amounts of VOCs, as do many adhesives and sealants. These compounds exist as liquids in the can or tube, and evaporate over time as the product cures. Some VOCs dissipate quickly; others over an extended period of time. Adhesives and binders in many building products also contain VOCs.

Some VOCs are inert—harmless. But others are irritating, toxic, or even cancer-causing. Formaldehyde is a common VOC of concern, and is primarily found in composite wood products (particleboard, medium-density fiberboard, and plywood). Formaldehyde was recently upgraded from a "probable human carcinogen" to a "known human carcinogen" by the International Agency for Research on Cancer.

Since VOCs are usually a mix of various chemicals, it's advisable to look for products with low or no VOCs. The VOC level is listed on the can for paints and finishes, and most paint manufacturers now offer a low- or no-VOC paint product. For composite wood products, select items that claim "no added urea formaldehyde." This particular form of formaldehyde is known to offgas for extended periods. On plywood, look for products listed as "exterior grade." These contain more stable resins that don't offgas formaldehyde like the interior grade products, ironically making them better for interior use than the interior grade products. Carpet often releases compounds when new. Request that any carpet you're having installed is unrolled at the warehouse for at least twenty-four hours before installation. This will help reduce the amount of offgassing that happens in your home.

Green Home Tech Sheet: Solar Hot Water

> Featuring technologies and innovations to help create healthy, high-performance homes

The high-strength glass tubes are designed to withstand hail and wind-blown branches.

Photo: Jon Alexander

The distintive look of evacuated tube systems can be harnessed to great design effect.

Photo: www.pugetsoundsolar.com

Solar hot water and photovoltaic (solar electric) systems are readily combined to offer a diverse renewable energy strategy.

Photo: www.pugetsoundsolar.com

In brief:

One-fifth of a typical Seattle home's energy budget is spent heating water. Solar hot water systems can help save money on water heating costs, while lessening your home's impact on the environment through reductions in carbon dioxide emissions related to energy use.

Federal tax incentives and recent state sales tax exemptions help shorten the already-quick (often less than ten years) payback on solar hot water systems.

In the Pacific Northwest, *evacuated tube* or *vacuum tube* solar collectors for water heating systems are a good choice, since they efficiently heat water even on cloudy days—a common occurrence here in Seattle.

Many people assume solar technologies and our cloudy Pacific Northwest climate are mutually exclusive. But it turns out that right at the time that water to power our hydroelectric plants is lowest (summer and early fall), solar systems are at their most productive. This complementary arrangement can help us stay local with our energy production and reduce the need to buy costly electricity on the open market.

Most people think of photovoltaic (solar electric) systems when they hear the word solar. Solar hot water systems are another promising technology that can reduce our need for electric- or natural gas-heated water, or even supplement space heating in homes with hot water based heat.

Energy down the drain

According to Seattle City Light, water heating consumes about 20 percent of the energy used in a typical home. As our homes become more efficient in terms of insulation and space heating, the proportion of energy going to heat water will continue to increase. High-efficiency water heaters, water saving fixtures and appliances, and efficient plumbing configurations can help reduce demand for hot water in the home. But an increasingly viable option for reducing conventional energy use for heating water is the solar hot water system.

How it works

Residential solar hot water systems come in a variety of configurations and levels of sophistication. *Batch or integral collector-storage systems* are the simplest, basically consisting of water-filled tanks or tubes painted black in an insulated box with a transparent top. The system preheats an existing hot water heater's input water. While relatively low cost, these systems are bulky and often unattractive, can freeze in cold weather, and often require structural reinforcement since they impose heavy loads on the roof.

Flat plate collectors are the most common form used in solar hot water systems. They too feature an insulated box with a translucent top. But they "up the technological ante" by including a heat-absorbing plate with liquid-containing tubes in or on the plate. These collectors are more efficient than the batch systems at gathering heat, but work best in direct sunlight—something we don't get a lot of in Seattle.

The latest development in solar hot water technology is the *evacuated tube* or *vacuum tube* solar collector. These high-tech systems consist of a series of long glass tubes, each housing a pipe and a finned absorber plate. The pipe contains a water-based heat transfer fluid. The air within the tube is removed (creating a vacuum), to lower the boiling point of the transfer fluid and to

Green Home Tech Sheet: Solar Hot Water

Collectors can be mounted vertically or horizontally, although the goal is to maximize the unit's exposure to the sun.
Photo: www.pugetsoundsolar.com

Hot water storage, a circulation system, and supplemental heating are also key parts of a system.
Photo: www.pugetsoundsolar.com

If roof mounting isn't available or desirable, solar hot water collectors can be mounted wherever sufficient sun exposure permits.
Photo: www.pugetsoundsolar.com

Find out more:

US Department of Energy
Office of Energy Efficiency & Renewable Energy
<eere.energy.gov>
(click on *Solar* under the *Renewable Energy* section).
Technical information on solar energy and solar hot water systems.

Solar Washington
<solarwashington.org>
Information on solar-related trainings and events in Washington, and a list of members, including contractors and solar energy specialists.

Energy Star
<energystar.gov>
Provides a good synopsis of current tax credits for energy efficiency and solar hot water systems.

reduce heat loss. As the sun strikes the finned absorber plate, heat is transfered to the liquid in the pipe. The heated liquid travels up the pipe to a heat exchanger, where the heat is again transfered, this time to the water supply. The result is a high-efficiency system that can produce heated water even on cloudy days.

The high-tech look of evacuated tube solar collectors is a draw to some, and a drawback to others. The systems maintain a relatively low profile on a roof, meaning they can be unobtrusive if that's the intent. Alternatively, they can be used as a design element and focal point for those that want to show off their green ways..

The collectors are just part of a solar hot water system. Systems also consist of a storage tank to hold the hot water until needed, a circulation system to move the fluid from the collectors to the storage tank, an overall controller for the system, and a backup heat source.

Tax incentives

The Federal Energy Policy Act of 2005 includes incentives for installing solar hot water systems. Homeowners can receive a tax credit worth 30% of the installed cost of a solar hot water system, up to $2000. Note this is a tax *credit*: dollars subtracted directly from tax dollars owed, rather than deducting the amount from earned income.

The credit is available for systems "placed in service" in 2006 or 2007. See sidebar for links to additional information. Additionally, Washington State recently added solar hot water systems to its list of solar products exempt from state sales tax, further reducing the cost of systems to homeowners.

Cost

Solar technologies tend to have a high up-front cost, but a long life (often twenty years or more) and very low operating cost. The sticker shock can be addressed by rolling the cost of a system into your mortgage through a home improvement loan. Renewable energy experts also recommend reducing the up-front cost by identifying conservation strategies that minimize demand for hot water, allowing the installation of a smaller system. High-efficiency showerheads and aerators on fixtures, and water- and energy-efficient dishwashers and clothes washers will help minimize hot water demand. These efficiency upgrades usually cost much less than additional solar panels. Look to <savingwater.org> for help with reducing water use.

Sizing, designing and installing a solar hot water system is a technically complex job best left to a professional. Look for contractors with applied experience in this specialty field. One source is the Northwest EcoBuilding Guild's online "Green Pages." See <ecobuilding.org> to search its database of members. Also, look for experts by searching the membership of Solar Washington (see sidebar).